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increased in numbers, and with the Brewer Blackbirds search every newly cut alfalfa field for insects, and probably keep the caterpillar in check.

The valley fauna is noticeably lacking in the small arboreal insectivorous birds, such as vireos, warblers and chickadees, partly, perhaps, because of the scarcity of arboreal vegetation. All fruit trees have to be conscientiously sprayed.

The changed conditions have not only affected the resident species but have also attracted various winter visitants, the most abundant of which are the Gambel Sparrow (*Zonotrichia l. gambeli*) and, as I noted before, the Short-eared Owl. Various migrants spend several weeks in spring and fall, the most abundant species of which are the Audubon Warbler (*Dendroica auduboni*) and the Pipit (*Anthus rubescens*).

Palo Alto, California, August 29, 1914.

BREEDING OF THE BRONZED COWBIRD IN ARIZONA

By M. FRENCH GILMAN

WITH TWO PHOTOS BY H. T. MURPHY

IN THE CONDOR for September-October, 1909, I recorded the capture at Sacaton, Arizona, of what at the time I believed to be the Red-eyed Cowbird. In the July issue of *The Auk* of that year Mr. S. S. Visser recorded a male taken at Tucson; but in a later number of the same journal he published a correction, stating that it was the Bronzed Cowbird (*Tangavius aeneus aeneus*), the form from northwestern Mexico, instead of the Red-eyed Cowbird (*Tangavius aeneus involucratus*), of Texas and eastern and southern Mexico, as was previously supposed. Soon after my note appeared in THE CONDOR Mr. Wells W. Cooke, of the United States Biological Survey, wrote me to send him a specimen of the female, and he pronounced the bird submitted, sent June 11, 1910, to be *Tangavius a. aeneus*.

The first year that these Cowbirds appeared at Sacaton I saw at least two pairs, and possibly more, and they were mating, so presumably breeding. The year 1910, the first one of the season was seen May 9. On July 12 I found a young one on the ground under a cottonwood tree, just below an inaccessible Bullock Oriole's nest. All that spring from the time the first bird appeared, I had been carefully examining nests of Abert Towhees and Red-wing Blackbirds, thinking perhaps the cowbirds might deposit their eggs therein, as there is some similarity in size and ground color of the eggs of these several species. I examined about fifty of the towhees' nests and about half as many of the red-wings', but without success. The number of cowbirds seen during 1910 was about the same as the year previous.

The year 1911 I was working on the north side of the Gila River about four miles from Sacaton, and did nothing with them that season, though occasionally seeing two or three on the lawns at Sacaton. The next season, 1912, I was located on the north side of the river at an Indian village called Santan, and was in a position to take up the study again. I saw the first Bronzed Cowbird of that season at Sacaton on May 25, and June 5, a male appeared

here at Santan, eating crumbs the children had dropped from their lunch in a shed. He stayed around several days and became quite tame. No others appeared on the north side of the river until September 30, when two males and one female were seen. That season I extended my search and included Bullock Orioles in the list of probable hosts, but with no success.

The year 1913 they appeared earlier, the first being seen on May 5, when a male and two females were in evidence. The 10th of the month two pairs were seen at Santan; at Sacaton a male and three females were noted on May



Fig. 73. NEST OF ARIZONA HOODED ORIOLE CONTAINING TWO EGGS OF THE BRONZED COWBIRD AND FOUR OF THE DWARF COWBIRD

20. A few of the birds were observed here and at Sacaton all through the season, the last, a female, being seen September 18. I examined the nests of about twenty-five Bullock Orioles this season but without success.

I wrote Mr. Cooke asking what birds were hosts for the cowbirds, and he included the Hooded Oriole in the list. So I was ready for the season of 1914. The birds appeared at Sacaton May 9 of this season, and on the 13th they came to Santan. Two males and one female have stayed around the barnyard and the school grounds all the season, and occasionally two other males and a fe-

male are seen with them. They are quite tame and get in the shade of a shed and eat watermelon every day.

When the Bullock Oriole began breeding I went to work to examine all the nests I could find. I looked into twenty-eight but no alien eggs were found. Then the Hooded Orioles began nesting, and while they seem fairly numerous, comparatively few nests are seen and most of them hard to reach.

June 28 I climbed to a nest of the Hooded Oriole about twenty feet from the ground in a big cottonwood tree. The nest could not be reached, but getting directly above it I saw a greenish white egg, and knew the long looked for was found. I used a pocket knife vigorously, cut the big branch off and secured the nest. In it were two eggs of the Bronzed Cowbird and four of the Dwarf Cowbird (*Molothrus ater obscurus*). The nest was typical of the species, and made of fiber from the Washington fan palm (see fig. 73). This was at Sacaton, on the south side of the Gila River. Both eggs of the Bronzed Cowbird had holes picked in them, one showing a little incubation, while the other was nearly fresh. Of the Dwarf Cowbirds' eggs, three were slightly incubated, and the fourth fresh. What became of the oriole's eggs is a problem, as is also the cause of the holes in the Bronzed Cowbirds' eggs. My opinion is that the Dwarf Cowbird that deposited the last egg saw the nest was too full of alien eggs, and so picked holes in those of the other species. If such be the case it would explain why the Bronzed Cowbird does not increase faster, for the Dwarf is very numerous here. As nearly as I can estimate the number of the former species they remain about the same as when I first saw them five years ago. If the oriole picked the holes she showed rank favoritism in saving the Dwarf eggs. Evidently her patience was exhausted, for the eggs were cold when found, and the nest apparently deserted.

At Santan, July 7, I found a Hooded Oriole's nest with four of her own eggs and one of the Bronzed Cowbird. The nest was seventeen feet up in a cottonwood, and built of grass. Incubation was advanced, and one of the Oriole eggs was infertile. Another Hooded Oriole's nest found the same day had three Oriole eggs and one Dwarf Cowbird egg, so the Dwarfs evidently use the Hooded Oriole frequently as host, though I have never found them in Bullock Oriole nests. July 11, not far from the nest with the one Bronzed Cowbird egg, I found another nest of the Hooded Oriole with two legitimate eggs and two of the Bronzed Cowbird, incubation begun. This nest was in a cottonwood tree about fourteen feet from the ground, and built of grass with some horse hair lining (see fig. 74). Two other Hooded Orioles's nests examined this season contained only the owners' eggs.

A few notes on the actions of these birds as observed here may prove of interest. With few exceptions they show no indications of being paired, as do most birds. They are seen singly or in twos or threes of either sex. One day there were four males eating watermelon in the back yard near the door, and two females were out in the barnyard by themselves. Two males have been together in the school grounds much of the time, and nearly always when females are seen they are by themselves. It is not strange that they seek solitude, as the males appear so amatory as to be a nuisance. The courtship antics are interesting. A male will approach to within three feet of his partner, fluff out his feathers, stand up straight and begin to flutter his wings. He increases the speed and violence of the fluttering till he appears in a perfect frenzy, then suddenly springs into the air from three to six feet and slowly descends, body perpendicular, beak thrust against breast and tail thrust forward under the

body. All the while he is furiously beating his wings, the noise being audible sixty yards distant. When he alights, usually about a foot from the female, he approaches her in short grotesque hops, with wings outspread. Sometimes after alighting he starts to approach her, then suddenly jumps into the air about three feet and flies rapidly around her in a circle about fourteen feet in diameter, flying with seemingly rigid wings, and making a loud whirring noise with them. If the birds are near a tree it is encircled by this flight.



Fig. 74. NEST OF ARIZONA HOODED ORIOLE CONTAINING TWO EGGS OF THE BRONZED COWBIRD AND TWO OF THE ORIOLE

One day I noticed two males eating watermelon. After they had had enough they approached each other, and one thrust his beak straight into the air. The other then began vibrating his wings, and went through the courtship formula I have just described. When he alighted from the circular flight the other began fluttering wings, and duplicated the performance. This was done twice by each bird, and I judged they were either practicing or it

was done in rivalry, for the edification of a female under another tree a few yards distant.

I have heard them utter only two notes, the more common being a high-pitched squeak with a decided burr to it, somewhat similar to that of the Dwarf, which latter, however, lacks the burr. The other note, rarely heard, is like the least discordant note of the overture to the Yellow-headed Blackbird's song.

The birds, as stated, stay around the barnyard where they pick up corn and other grains and scraps from the table thrown to the chickens; and they also remain around the school yard, where they eat watermelon set in the shade for birds of all kinds. They are sometimes seen in company with the Dwarf Cowbirds, but they make them stand back when there is refreshment at hand. The Thrashers are about the only birds that do not take a back seat for them at the table, though they seem to observe a sort of truce with the Gila Woodpeckers, and eat from the same slice of melon. Sometimes one, and sometimes the other, gets peevish and ends the truce.

Sacaton, Arizona, July 26, 1914.

FROM FIELD AND STUDY

Arizona Records.—The following notes were suggested by the reading of Swarth's recently published "Distributional List of the Birds of Arizona". The records of the Band-tailed Pigeon breeding in the Santa Rita Mountains apparently give an additional breeding station for the species within the state, but with this exception my remarks are mainly directed toward the correction of mistakes, which in one way or another have grown up about records made many years ago.

Band-tailed Pigeon. *Columba fasciata*. There apparently are no published statements of the breeding of this bird in the Santa Rita Mountains. Two nests were found by me in this range, in the vicinity of Greaterville, with data as follows. One on July 6, 1884, the nest made of fine twigs, laid across a horizontal fork of a small branch of a pine tree, about twenty feet from the ground. Parent bird seen on the nest. Incubation advanced. The second was found July 18, 1884. It also contained one egg, was placed in an oak tree, twelve feet from the ground, and the parent bird was flushed from the nest. Incubation begun.

In this connection I wish, for the sake of emphasis, to repeat the statement I have already made (CONDOR xv, 1913, p. 129), in regard to an early nest I found in the Laguna Mountains, San Diego County, California, on March 6, 1877. This record was mistakenly applied to Arizona by Bendire (Life Hist. N. Am. Birds, i, 1892, p. 124), giving an erroneous idea of the length of the breeding season in that state. It has, in fact, been cited for that very purpose by Grinnell (CONDOR xv, 1913, p. 32) in his excellent account of the species. As a matter of fact the Band-tailed Pigeon is a late breeder in Arizona, the season when eggs may be found extending approximately from the first of July until toward the end of September. In the hope of correcting a mistake of long standing I may be excused for repeating this statement.

Baird Sparrow. *Ammodramus bairdi*. Two specimens collected by myself, one on August 29, the other August 30, 1884, about eight miles north of Sasabe, Sonora, Mexico. These birds were recorded by Brewster (*Auk*, ii, 1885, p. 198). Mr. Swarth has not included this record in his "List", perhaps being under the impression that it represents a Mexican locality, but the point of capture was north of the United States-Mexican boundary line, and in Arizona, about seventy miles southwest of Tucson.

Slate-colored Sparrow. *Passerella iliaca schistacea*. Three specimens taken by myself on Big Sandy Creek, near Signal, Mohave County, Arizona. A female shot February 6, and two males, February 9, 1880. Brewster's record for Tucson (*Auk*, ii, 1885, p. 198) was a mistake, as it referred to one of these birds.—FRANK STEPHENS, *San Diego, California*.